CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

- 1. (Cancelled).
- 2. (Previously Presented) Polythiophenes of the formula

$$\begin{bmatrix}
\begin{pmatrix} S \\ a \end{pmatrix} \\
 & \begin{pmatrix} S \\ b \end{pmatrix} \\
 & \begin{pmatrix} S \\ c \end{pmatrix} \\
 & \begin{pmatrix} S \\ d \end{pmatrix} \\
 & \begin{pmatrix}$$

wherein R is a side chain; a is an integer of from about 0 to about 5; b, c, and d are integers of from about 1 to about 5; and n represents the degree of polymerization of from about 5 to about 5,000; the number average molecular weight (M_n) of the polythiophenes is from about 2,000 to about 100,000, and the weight average molecular weight (M_w) is from about 4,000 to about 500,000, each measured by gel permeation chromatography using polystyrene standards, and wherein said polythiophenes possess a conductivity of from about 10^{-6} to about 10^{-9} S/cm.

3. (Previously Presented) Polythiophenes in accordance with **claim 2** and of the formulas

$$\begin{array}{c|c} C_6H_{13} \\ \hline \\ S \\ \hline \\ S \\ \hline \\ H_{13}C_6 \\ \end{array}$$

(II-a)

$$C_7H_{15}$$
 S
 $H_{15}C_7$

(II-b)

$$\begin{array}{c|c} C_8H_{17} \\ \hline \\ S \end{array} \begin{array}{c} S \\ \hline \\ H_{17}C_8 \end{array}$$

(II-c)

$$C_{10}H_{21}$$
 S
 $H_{21}C_{10}$

(II-d)

$$C_{12}H_{25}$$
 S
 $H_{25}C_{12}$

. (II-e)

$$(CH_2)_3(CF_2)_5CF_3$$
 S
 S
 $CF_3(CF_2)_5(CH_2)_3$
(II-h)

$$CH_2(OCH_2CH_2)_2OCH_3$$
 S
 S
 S
 $CH_3O(CH_2CH_2O)_2CH_2$
(II-i)

$$C_{12}H_{25}$$
 S
 S
 $H_{25}C_{12}$
(II-k)

(II-l)

$$\begin{array}{c|c}
C_{10}H_{21}C_{10}H_{21} \\
S & S \\
\hline
S & n
\end{array}$$
(II-m)

$$C_{12}H_{25}$$
 S
 $C_{12}H_{25}$
 $C_{12}H_{25}$
(II-n)

4. (Previously Presented) Polythiophenes in accordance with **claim 2** and of the formulas

$$C_6H_{13}$$
 S
 S
 $H_{13}C_6$
(II-a)

$$C_7H_{15}$$
 S
 $H_{15}C_7$
(II-b)

$$\begin{array}{c|c}
C_8H_{17} \\
S \\
S \\
H_{17}C_8
\end{array}$$
(II-c)

$$C_{10}H_{21}$$
 S
 $H_{21}C_{10}$
(II-d)

$$C_{12}H_{25}$$
 S
 $H_{25}C_{12}$
(II-e)

5. (Cancelled).

6. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein R is alkoxyalkyl, siloxy substituted alkyl, a perhaloalkyl, or a polyether.

7-13. (Cancelled).

- 14. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein R is alkyl containing from 1 to about 20 carbon atoms; wherein n is from about 10 to about 1,000; the M_n is from about 4,000 to about 50,000; and the M_w is from about 5,000 to about 100,000.
- 15. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein the alkyl side chain R contains from about 6 to about 12 carbon atoms.
- 16. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein the alkyl side chain R is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, or dodecyl.
- 17. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein the side chain R is a perfluoroalkyl of about 2 to about 15 carbon atoms.
- 18. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein the side chain R is siloxyalkyl of trimethylsiloxyalkyl or triethylsiloxyalkyl, and wherein alkyl optionally contains from about 4 to about 10 carbons, and which alkyl is butyl, pentyl, hexyl, heptyl, or octyl.

19-20. (Cancelled).

- 21. (Previously Presented) Polythiophenes in accordance with **claim 2** and wherein n is from about 100 to about 1,000.
- 22. (Original) Polythiophenes in accordance with **claim 21** wherein R is alkyl containing from about 1 to about 20 carbon atoms; or wherein R is alkyl containing from about 6 to about 12 carbon atoms.

- 23. (Original) Polythiophenes in accordance with **claim 21** wherein R is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, or dodecyl.
- 24. (Original) Polythiophenes in accordance with **claim 21** wherein b and d are from about 1 to about 5.
- 25. (Original) Polythiophenes in accordance with **claim 21** wherein b and d are from about 1 to about 3.
- 26. (Original) Polythiophenes in accordance with **claim 21** wherein a is from about 0 to about 5, and c is about 1 to about 5, or wherein a is about 0 to about 3, and c is about 1 to about 3.
- 27. (Previously Presented) Polythiophenes in accordance with **claim 2** wherein said polythiophene is selected from the group consisting of polythiophenes (II-a) through (II-e) and (II-g), and wherein n is from about 100 to about 4,000

$$C_6H_{13}$$
 S
 $H_{13}C_6$
(II-a)

28. (Original) A process for the preparation of polythiophenes comprising reacting about 1 molar equivalent of a suitable monomer in an organic solvent with about 1 to about 5 molar equivalents of a ferric chloride at a temperature of from about 25°C to about 80°C, and which polythiophenes are of the formula

$$\begin{array}{c|c} & & & \\ \hline \end{array}$$

wherein a, b, c, and d represent the number of segments; each R is a side chain, and n represents the degree of polymerization or the number of repeating segments.

29. (Previously Presented) A process in accordance with **claim 28** which comprises reacting about 1 molar equivalent of a monomer of the formula

$$Br$$
 R
 R
 R
 R
 R

with a 1.1 molar equivalent of Zn in anhydrous tetrahydrofuran, followed by treatment with a catalytic amount of [1,2-bis(diphenyl phosphinoethane)] dichloro nickel (ii) and subsequent reaction by heating at a temperature of about 30°C to about 80°C, and which polythiophene is of the formula

$$\begin{array}{c|c} & & & \\ &$$

- 30. (Original) A process in accordance with **claim 28** wherein said R side chain is alkyl, substituted alkyl, or perhaloalkyl.
- 31. (Original) A process in accordance with **claim 28** wherein alkyl contains from 1 to about 25 carbon atoms or from 4 to about 15 carbon atoms; wherein substituted alkyl is alkoxy alkyl, or siloxy substituted alkyl; and said perfluoro is a polyether.

- 32. (Cancelled).
- 33. (Cancelled).